FIG. 1

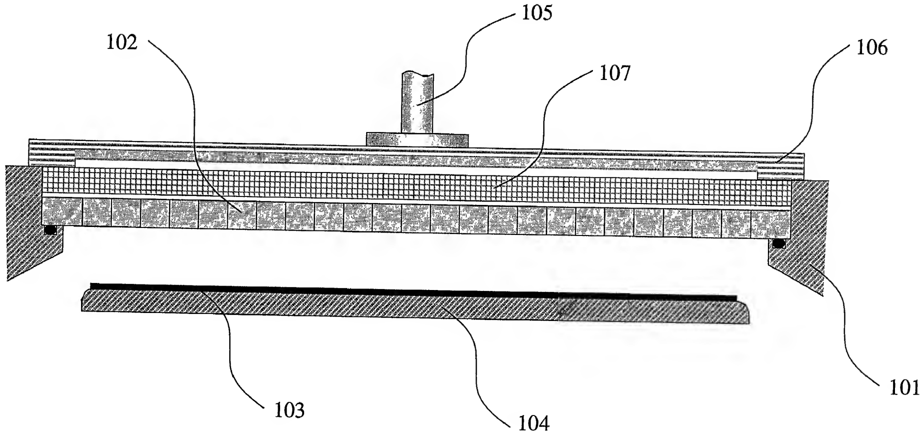


FIG. 2

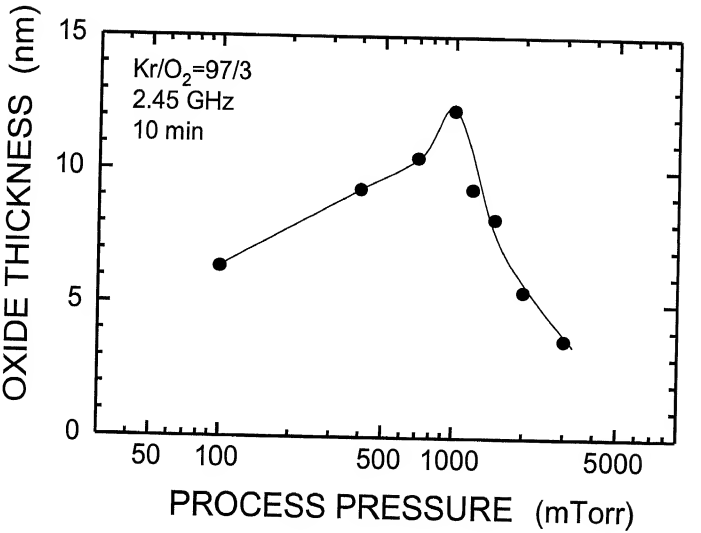

OXIDE THICKNESS (nm)
15
10
5
0
Kr/O2=97/3
2.45 GHz
10 min
50
100
500
1000
5000
PROCESS PRESSURE (mTorr)

FIG. 3

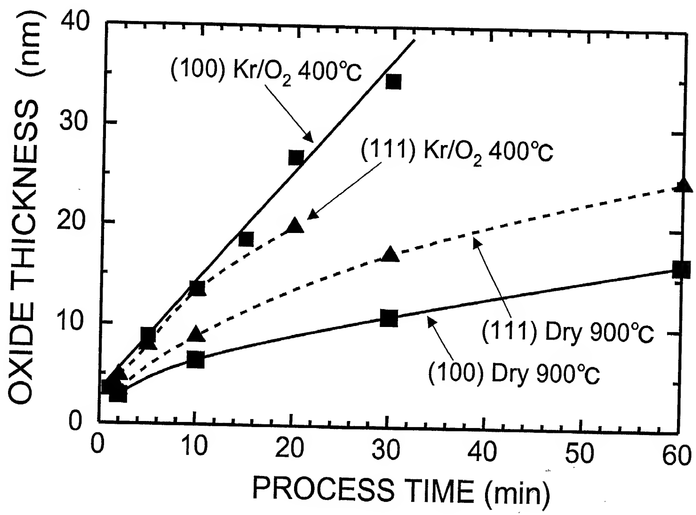


FIG. 4

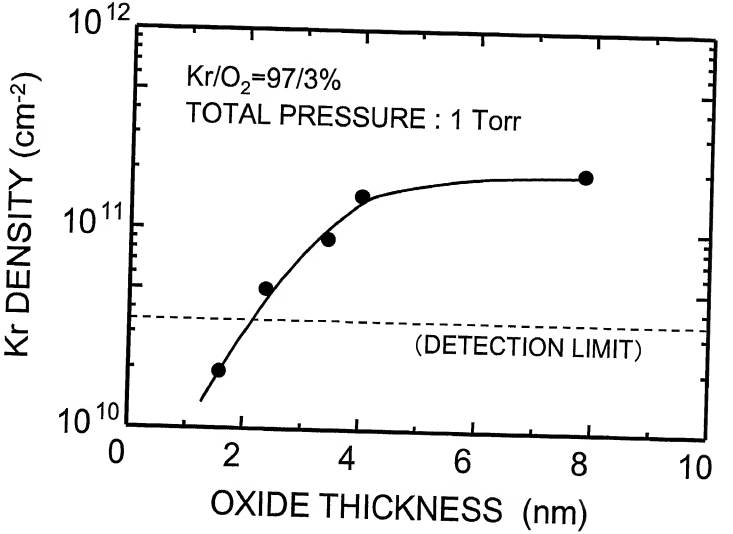

10^{12}
10^{11}
10^{10}
Kr DENSITY (cm^{-2})
Kr/O_2=97/3%
TOTAL PRESSURE : 1 Torr
(DETECTION LIMIT)
0
2
4
6
8
10
OXIDE THICKNESS (nm)

FIG. 5

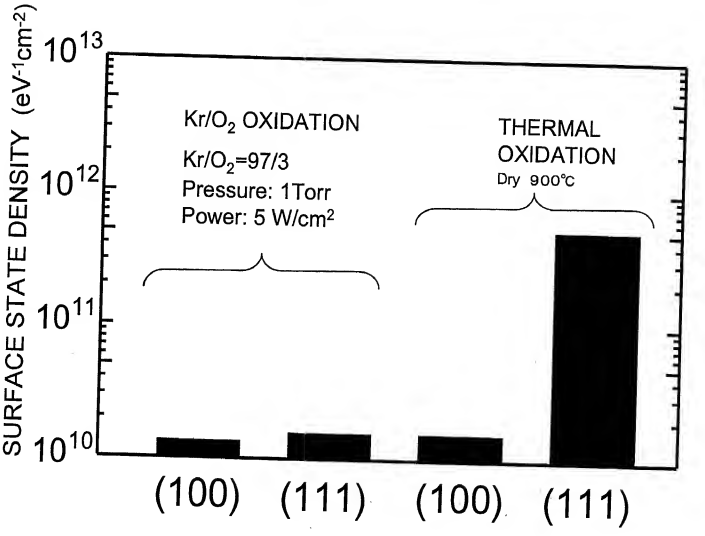

SURFACE STATE DENSITY (eV-1cm-2)
10^13
10^12
10^11
10^10
Kr/O2 OXIDATION
Kr/O2=97/3
Pressure: 1Torr
Power: 5 W/cm2
THERMAL
OXIDATION
Dry 900℃
(100)
(111)
(100)
(111)

FIG. 6

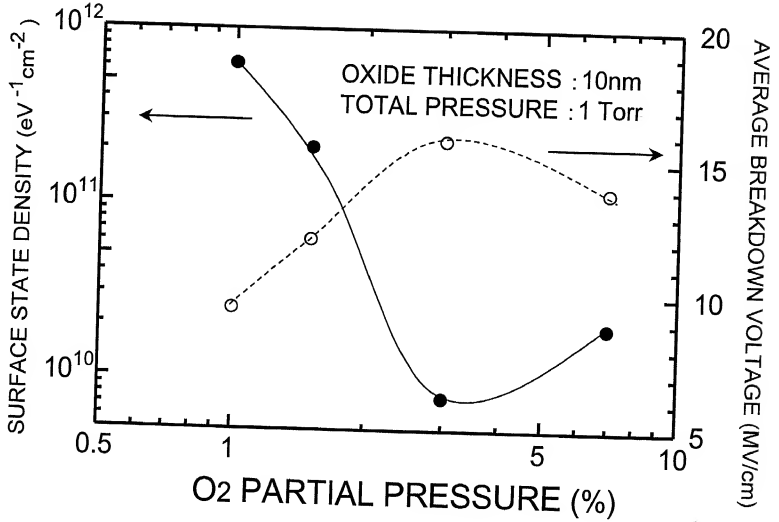

SURFACE STATE DENSITY (eV^{-1}cm^{-2})
10^{12}
10^{11}
10^{10}
OXIDE THICKNESS : 10nm
TOTAL PRESSURE : 1 Torr
AVERAGE BREAKDOWN VOLTAGE (MV/cm)
20
15
10
5
0.5
1
5
10
O2 PARTIAL PRESSURE (%)

FIG. 7

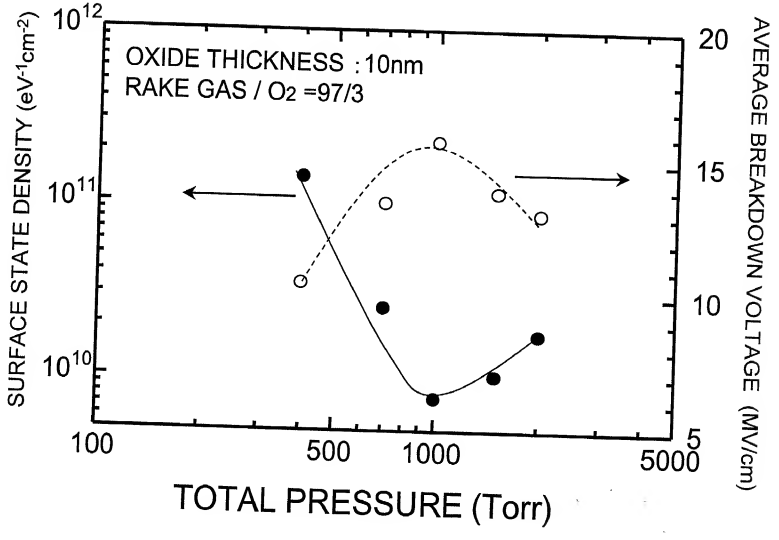

OXIDE THICKNESS : 10nm
RAKE GAS / O2 =97/3
SURFACE STATE DENSITY (eV-1cm-2)
AVERAGE BREAKDOWN VOLTAGE (MV/cm)
TOTAL PRESSURE (Torr)
10^12
10^11
10^10
20
15
10
5
100
500
1000
5000

FIG. 8

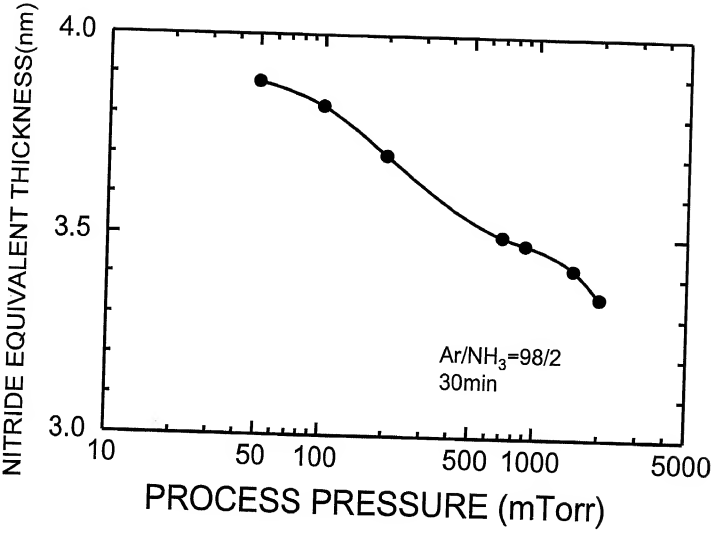

NITRIDE EQUIVALENT THICKNESS(nm)
4.0
3.5
3.0
10
50
100
500
1000
5000
PROCESS PRESSURE (mTorr)
Ar/NH3=98/2
30min

FIG. 9

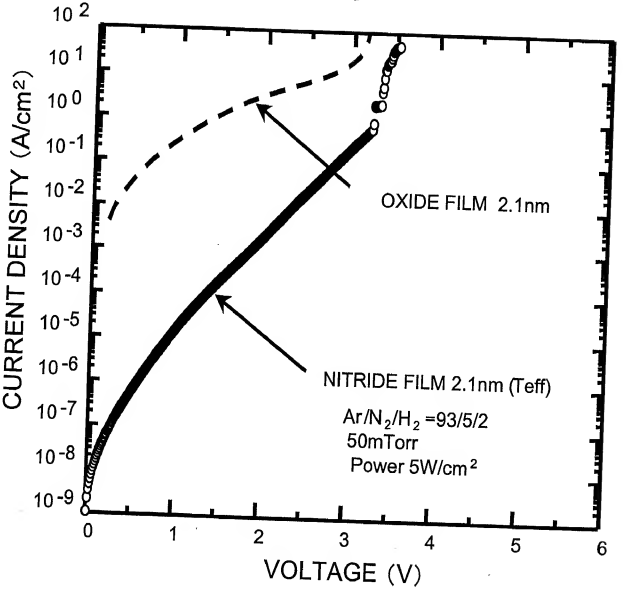

CURRENT DENSITY (A/cm²)
10 2
10 1
10 0
10 -1
10 -2
10 -3
10 -4
10 -5
10 -6
10 -7
10 -8
10 -9
0
1
2
3
4
5
6
VOLTAGE (V)
OXIDE FILM 2.1nm
NITRIDE FILM 2.1nm (Teff)
Ar/N2/H2 =93/5/2
50mTorr
Power 5W/cm²

FIG.10A

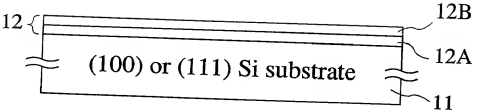


FIG.10B

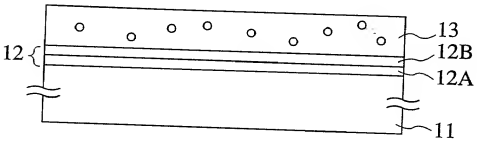


FIG.10C

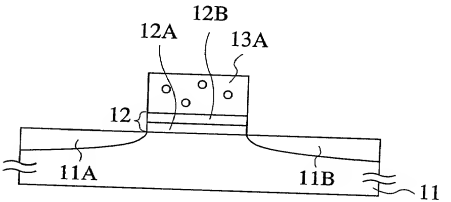


FIG.10D

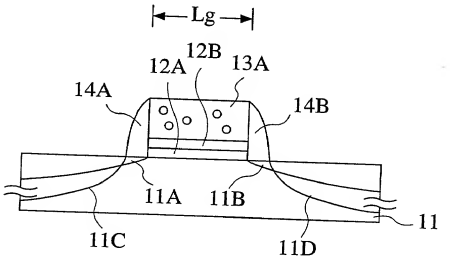


FIG. 11A

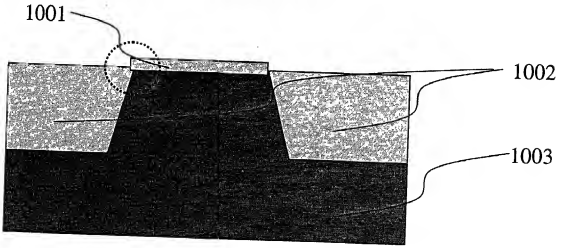
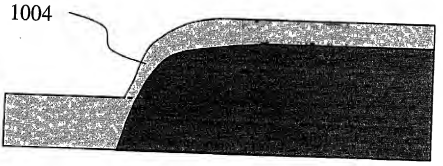
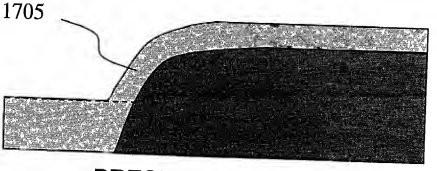


FIG. 11B



PRIOR ART

FIG. 11C



PRESENT INVENTION

FIG. 12

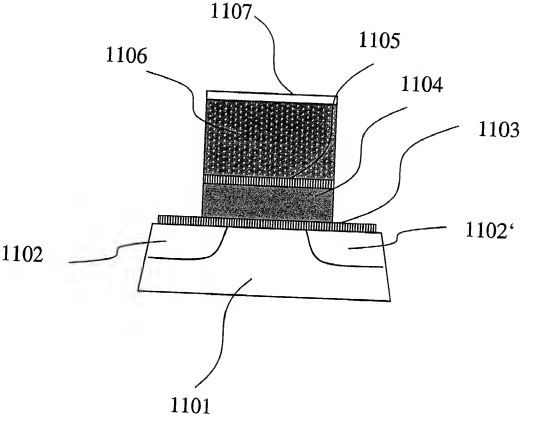


FIG. 13

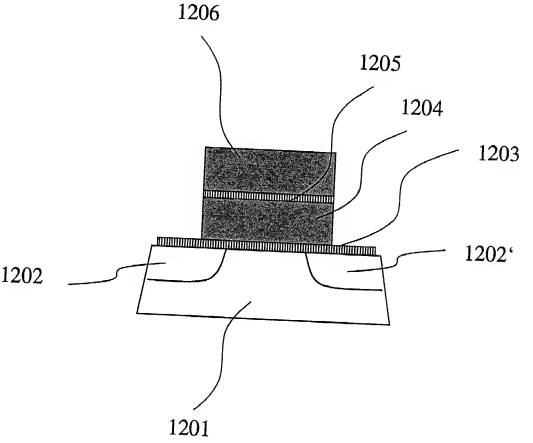


FIG. 14

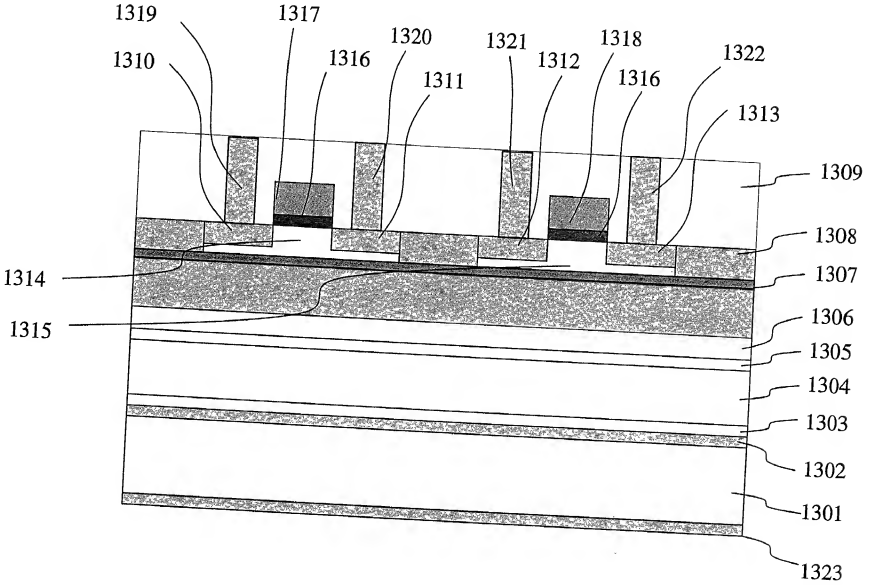


FIG. 15

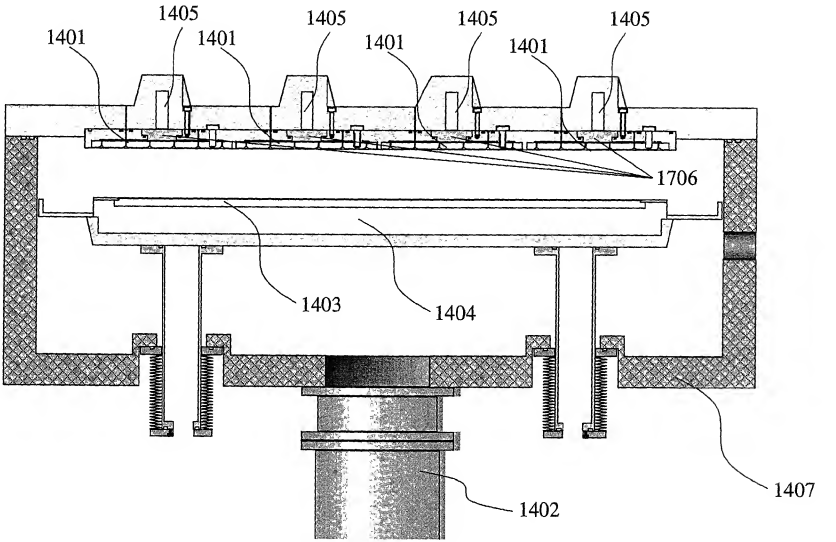


FIG. 16

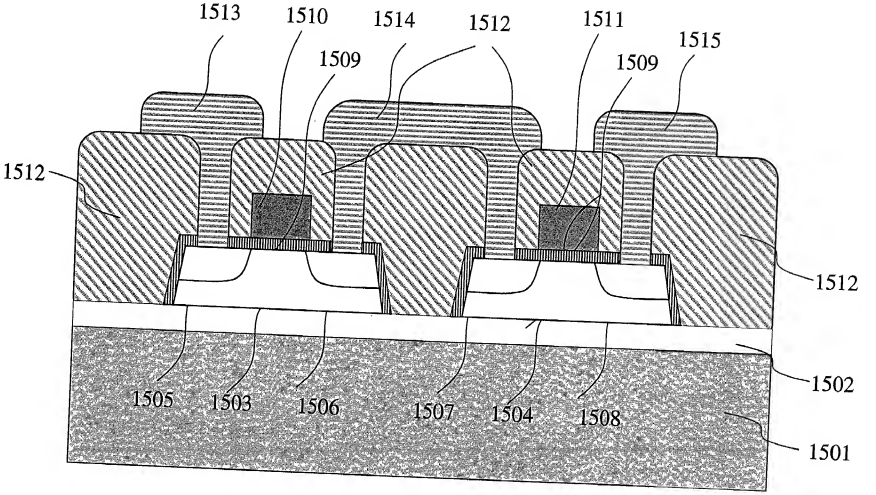

1513
1510
1514
1512
1511
1515
1509
1509
1512
1512
1505
1503
1506
1507
1504
1508
1502
1501

FIG. 17